Patent claims

1. A device for protecting a person outside a motor vehicle, in particular pedestrians or cyclists, having at least one inflatable airbag acting outside the motor vehicle,
characterized
in that, when inflated, the airbag (2, 2', 2'' 2''', 2'''', 2''''', 2a, 2a', 2b, 2b', 2c, 2c') comprises, in its lower region in relation to the motor vehicle (1), a contact region (21) for the first contact with a person (3) in the event of a collision, said contact region being at a greater distance from the motor vehicle body (1) perpendicularly to the vertical axis of the motor vehicle than other regions of the airbag (2, 2', 2'', 2''', 2'''', 2''''', 2a, 2a', 2b, 2b', 2c, 2c'), and in that the airbag (2, 2', 2'', 2''', 2'''', 2''''', 2a, 2a', 2b, 2b', 2c, 2c') has an impact surface (20) adjoining this contact region (21) for receiving a person (3) after the first contact.

2. The device as claimed in claim 1, characterized in that the impact surface (20) is inclined with respect to the plane running perpendicularly to the vertical axis of the vehicle.

3. The device as claimed in claim 2, characterized in that the impact surface (20) rises counter to the direction of travel.

4. The device as claimed in claim 2 or 3, characterized in that the impact surface (20) extends essentially obliquely with respect to the longitudinal axis of the vehicle above the contact region (21).

5. The device as claimed in one of the preceding claims, characterized in that the airbag (2, 2', 2'', 2''', 2'''', 2''''', 2a, 2a', 2b, 2b', 2c, 2c') is formed essentially in the manner of a wedge.

6. The device as claimed in one of the preceding claims, characterized in that the inclination and/or the stiffness of the impact surface (20, 20', 20'', 20''', 20'''', 20''''', 20a, 20a', 20b, 20b', 20c, 20c') can be adapted to factors influencing the impact kinematics, in particular the vehicle speed and the angle of impact.

7. The device as claimed in one of the preceding claims, characterized in that the airbag (2, 2', 2'', 2''', 2'''', 2''''', 2a, 2a', 2b, 2b', 2c, 2c') has at least two chambers (25a, 25b, 25c) which can be pressurized to different extents.

8. The device as claimed in claim 7, characterized in that each of the chambers (25a, 25b, 25c) is assigned at least one gas generator (6a, 6b, 6c).

9. The device as claimed in one of the preceding claims, characterized in that the impact surface (20, 20', 20'', 20''', 20'''', 20''''', 20a, 20a', 20b, 20b', 20c, 20c') is dimensioned in such a manner that a person (3) can be brought fully into contact with it in the event of a collision.

10. The device as claimed in one of the preceding claims, characterized in that the contact region (21) is arranged essentially on a plane below the

center of gravity of the body, in particular level with the lower legs (30) of a person (3) located outside the motor vehicle (1).

11. The device as claimed in one of the preceding claims, characterized in that the deployment of the airbag (2, 2', 2'', 2''', 2'''', 2''''', 2a, 2a', 2b, 2b', 2c, 2c') is triggered via at least one proximity sensor (13) for detecting people (3) outside the vehicle (1).

12. The device as claimed in one of the preceding claims, characterized in that the airbag (2, 2', 2'', 2''', 2'''', 2''''', 2a, 2a', 2b, 2b', 2c, 2c') is arranged in the front region (10) of the vehicle (1).

13. The device as claimed in one of the preceding claims, characterized in that the airbag (2, 2', 2'', 2''', 2'''', 2''''', 2a, 2a', 2b, 2b', 2c, 2c'), when not in use, is accommodated in a bumper (11) and/or a protective strip (12).

14. A device for protecting a person outside a motor vehicle, in particular pedestrians or cyclists, having at least one inflatable airbag acting outside the motor vehicle,
characterized
in that the airbag (2''', 2'''') can at least partially be filled with relative wind.

15. The device as claimed in claim 14, characterized in that the airbag (2''', 2'''') can be filled with relative wind through an air inlet (13, 23) open in the direction of travel,

and the air inlet (13, 23) can be closed in a gastight manner before, during or after ignition of a gas generator (6).

16. The device as claimed in claim 15, characterized in that the air inlet (13) is arranged on a vehicle part, in particular the bumper (11).

17. The device as claimed in either of claims 15 and 16, characterized in that the air inlet is formed as an opening (23) in the airbag (2'''').

18. The device as claimed in claim 17, characterized in that the airbag (2'''') has at least one intercepting cable (24) which acts, on the one hand, on an edge region (240) of the opening (23) and, on the other hand, on a fixing point (241) on the airbag (2''''), which fixing point lies opposite this edge region (240) with respect to the opening (23), such that, as the pressure in the airbag (2'''') rises, the opening (23) is closed by the intercepting cable (24).

19. The device as claimed in claim 18, characterized in that the airbag has at least two chambers (220, 221), the opening (23) leading into a first chamber (220) and the gas generator (6) leading into a second chamber (221) and the fixing point (241) of the intercepting cable (24) being arranged on the second chamber (221).

20. A device for protecting a person outside a motor vehicle, in particular pedestrians or cyclists, characterized

in that at least two inflatable airbags (2a, 2a', 2b, 2b', 2c, 2c') are arranged outside the motor vehicle (1), the impact surfaces (20a, 20a', 20b, 20b', 20c, 20c') of which airbags have essentially the same orientation.

21. The device as claimed in claim 20, characterized in that the impact surfaces (20a, 20a', 20b, 20b', 20c, 20c') of the airbags (2a, 2a', 2b, 2b', 2c, 2c') are spatially separated from one another and are connected to one another by at least one connecting surface (4, 5) of the same orientation.

22. The device as claimed in claim 21, characterized in that the connecting surface (4, 5) is formed by airbag covering material stretched between the airbags (2a, 2a', 2b, 2b', 2c, 2c').

23. The device as claimed in claim 21 or 22, characterized in that the connecting surface is formed as an airbag (5).

24. The device as claimed in claim 23, characterized in that the airbag provided as the connecting surface is formed as a high-pressure airbag (5).

25. The device as claimed in claim 20, characterized in that the impact surfaces (20a, 20a', 20b, 20b', 20c, 20c') of the inflated airbags (2a, 2a', 2b, 2b', 2c, 2c') adjoin one another essentially without a gap.

26. The device as claimed in one of claims 20 to 25, characterized in that in the event of triggering, at least one of the airbags (2a, 2a', 2b, 2b', 2c, 2c') is not inflated.

27. The device as claimed in one of claims 20 to 26, characterized in that at least one gas generator (6, 6a, 6b, 6c) which can be assigned to just one of at least two airbags (2a, 2a', 2b, 2b', 2c, 2c') is provided for filling the airbags (2a, 2a', 2b, 2b', 2c, 2c').

28. The device as claimed in one of claims 20 to 27, characterized in that at least one gas generator (6, 6a, 6b, 6c) is provided for the simultaneous filling of at least two airbags (2a, 2a', 2b, 2b', 2c, 2c').

29. The device as claimed in one of claims 20 to 28, characterized in that at least one of the airbags (2a, 2a', 2b, 2b', 2c, 2c') is formed as the airbag as claimed in one of claims 1 to 19.

30. A device for protecting a person outside a motor vehicle, in particular pedestrians or cyclist, having at least one inflatable airbag acting outside the motor vehicle and having at least two chambers,
characterized
in that, when the airbag is inflated, at least two of the chambers are arranged one above another along the vertical axis of the motor vehicle, the chamber arranged in the lower region of the airbag being more highly pressurized than the chamber situated above it.

31. The device as claimed in claim 30, characterized in that the chamber arranged in the lower region is more highly pressurized than each of the chambers situated above it.

32. A device for protecting a person outside a motor vehicle, in particular pedestrians or cyclists, having at least two inflatable airbags acting outside the motor vehicle,
characterized
in that, when inflated, at least two of the airbags (2e, 2e') are arranged one above another along the vertical axis (z) of the motor vehicle, the airbag (2e') arranged in the lower region being more highly pressurized than the airbag (2e) situated above it.

33. The device as claimed in claim 32, characterized in that the airbag (2e') arranged in the lower region is more highly pressurized than each of the airbags (2e) situated above it.

34. The device as claimed in one of claims 30 to 33, characterized in that the impact surface (20e) formed by the inflated airbags (2e, 2e') and intended for receiving a person extends essentially along the vertical axis (z) of the motor vehicle before the first contact with the person.

35. The device as claimed in claim 34, characterized in that the impact surface (20e) extends essentially perpendicularly to the longitudinal axis of the motor vehicle before the contact with the person.

36. The device as claimed in one of claims 30 to 35, characterized in that the gas pressures prevailing in the airbags (2e, 2e') and/or chambers are adapted to the respectively prevailing kinematic conditions of the expected impact.

37. The device as claimed in one of claims 30 to 36, characterized in that at least one of the airbags (2e, 2e') is formed as the airbag as claimed in one of claims 1 to 28.